Amendments to the Claims

Please cancel claims 42 and 49 and add new Claims 53-55. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1. (Previously Presented) A method for the removal of airborne molecular contaminants (AMC) from a substrate, comprising:

contacting at least a portion of the substrate with a purified purge gas at a temperature of about 20 °C to 100 °C, the purified purge gas comprising oxygen (O_2) and water, the purified purge gas having an AMC concentration less than about 1 part per billion (ppb) on a volume basis, the substrate contaminated with AMC before the substrate is contacted with purified purge gas;

producing a contaminated purge gas by transferring a portion of the contaminants from the substrate into the purified purge gas; and

removing the contaminated purge gas from the substrate, thereby removing AMC from the substrate.

2. (Canceled).

3. (Previously Presented) The method of claim 1, wherein the method is repeated until the contaminated purge gas has an AMC concentration below about 1 ppb AMC on a volume basis.

4. (Previously Presented) The method of claim 1, wherein the AMC concentration of the purified purge gas is less than about 100 parts per trillion (ppt) on a volume basis.

5. (Previously Presented) The method of claim 1, wherein the AMC concentration of the purified purge gas is

a) less than about 10 ppt on a volume basis; or

b) less than about 1 ppt on a volume basis.

6. (Canceled)

7. (Canceled)

8. (Previously Presented) The method of claim 1, wherein the water comprises at least about 100 parts per million (ppm) by volume of the purified purge gas.

9. (Previously Presented) The method of claim 8, wherein the water comprises about 100 ppm to about 0.5% by volume of the purge gas.

10. (Canceled).

11. (Previously Presented) The method of claim 1, wherein the substrate comprises at least one silicon substrate.

12. (Previously Presented) The method of claim 1, wherein the substrate is an interior surface of an ultrahigh purity gas line component.

13. (Previously Presented) The method of claim 1, wherein the substrate is the interior surface of a valve.

14. (Previously Presented) The method of claim 1, further comprising purging the substrate with an inert gas to remove at least one of oxygen and water after removing the contaminated purge gas from the substrate.

15. (Previously Presented) The method of claim 14, wherein the inert gas is selected from the group consisting of nitrogen, noble gases, methane and combinations thereof.

16-35. (Canceled).

36. (Previously Presented) The method of claim 1, wherein the substrate is an electropositive surface.

37. (Previously Presented) The method of claim 1, wherein the substrate is an electropolished surface.

38. (Previously Presented) The method of claim 1, wherein the substrate is a wafer.

39. (Canceled)

40. (Previously Presented) The method of claim 1, wherein the purified purge gas comprises oxygen at a concentration between about 1% and 25% on a volume basis.

41. (Previously Presented) The method of claim 1, wherein oxygen of the purified purge gas is provided as a component in extra clean dry air (XCDA).

42. (Canceled)

43. (Previously Presented) The method of claim 1 further comprising:
purifying a purge gas to produce the purified purge gas for contacting with the substrate.

44. (Previously Presented) The method of claim 1, wherein the method is performed at a temperature no higher than about 80° C.

45. (Previously Presented) The method of claim 44, wherein the method is performed at a temperature no higher than about 50° C.

46. (Previously Presented) A method for the removal of airborne molecular contaminants (AMC) from a substrate, comprising:

contacting at least a portion of the substrate with a purified purge gas at a temperature of about 20 °C to 100 °C, the purified purge gas comprising oxygen (O_2) and water, the purified purge gas having an AMC concentration less than about 1 part per billion (ppb) on a volume basis;

producing a contaminated purge gas by transferring AMC from the substrate into the purified purge gas; and

removing the contaminated purge gas from the substrate, wherein the oxygen and water in the purified purge gas are in an amount sufficient to remove AMC from the substrate at a faster rate than the method using a purge gas consisting essentially of nitrogen gas.

47. (Previously Presented) The method of claim 46, wherein the method is performed at a temperature no higher than about 80° C.

48-49. (Canceled)

50. (Previously Presented) The method of claim 15, wherein the inert gas is argon.

51. (Previously Presented) A method for the removal of airborne molecular contaminants (AMC) from a substrate, comprising:

contacting at least a portion of the substrate with a humidified purge gas comprising extra clean dry air (XCDA) which has been humidified by the addition of water vapor thereto, the humidified purge gas having an AMC concentration less than about 1 part per billion (ppb) on a volume basis;

producing a contaminated purge gas by transferring a portion of the contaminants from the substrate into the purified purge gas; and

removing the contaminated purge gas from the substrate, thereby removing AMC from the substrate.

52. (Previously Presented) A method for the removal of airborne molecular contaminants (AMC) from a substrate, comprising:

contacting at least a portion of the substrate with a purified purge gas under conditions that do not chemically change or alter the AMC, the purified purge gas comprising oxygen (O_2) and water, the purified purge gas having an AMC concentration

less than about 1 part per billion (ppb) on a volume basis, the substrate contaminated with AMC before the substrate is contacted with purified purge gas;

producing a contaminated purge gas by transferring a portion of the contaminants from the substrate into the purified purge gas; and

removing the contaminated purge gas from the substrate, thereby removing AMC from the substrate.

53. (New) A method for purging organic contaminants from an organic contaminated component in a semiconductor manufacturing process, comprising:

causing the organic contaminants to outgas from a surface of the organic contaminated component in the semiconductor manufacturing process by contacting at least a portion of the surface with a purified purge gas comprising oxygen (O_2) and water;

transferring a portion of the outgassed organic contaminants from the organic contaminated component in the semiconductor manufacturing process into the purified purge gas to produce a contaminated purge gas comprising the outgassed organic contaminants;

removing the contaminated purge gas from the component in the semiconductor manufacturing process; and

repeating the above steps until an outgassing rate at the surface of the component in the semiconductor manufacturing process is reduced to 1 ppt or less.

54. (New) A method for purging airborne molecular contaminants (AMC) from a component in a semiconductor manufacturing process, comprising:

contacting at least a portion of the component in the semiconductor manufacturing process with a purified purge gas comprising oxygen (O_2) and water at a temperature of about 20 °C to 100 °C, the purified purge gas having an AMC concentration less than about 1 part per billion (ppb) on a volume basis, the component in the semiconductor manufacturing process contaminated with AMC before the component is contacted with purified purge gas;

producing a contaminated purge gas by transferring a portion of the contaminants from the component in the semiconductor manufacturing process into the purified purge gas; and

removing the contaminated purge gas from the component in the semiconductor manufacturing process, thereby removing AMC from the component in the semiconductor manufacturing process.

55. (New) A method for the removal of airborne molecular contaminants (AMC) from a substrate, comprising:

dehumidifying a purified purge gas comprising oxygen (O_2);

adding a controlled amount of ultrapure water to the dehumidified purified purge gas comprising oxygen (O_2) to form a purified purge gas comprising oxygen (O_2) and water having an AMC concentration less than about 1 part per billion (ppb) on a volume basis;

contacting at least a portion of the substrate with the purified purge gas comprising oxygen (O_2) and water;

producing a contaminated purge gas by transferring a portion of the contaminants from the substrate into the purified purge gas comprising oxygen (O_2) and water; and

removing the contaminated purge gas from the substrate, thereby removing AMC from the substrate.